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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/785,574

02/24/2004

Robert D. Maple

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9886

7590

10/03/2006

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EXAMINER

TRAN, VINCENT HUY

ART UNIT

PAPER NUMBER

2115

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/785,574

Applicant(s)

MAPLE ET AL.

Examiner

Vincent T. Tran

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2115

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to the communication filed on 2/24/04
2. Claims 1-19 are pending for examination.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10, 11, 18, 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. “monitored temperature are the same”, “average output current are the same”

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 4-5, 7, 11-13, 15, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Jacobs U.S. Patent No. 6,351,396.

7. As per claim 1, Jacobs discloses a device [power converter col. 1 lines 7-10], comprising:
a power source [18 fig. 1; col. 3 lines 61-62] and a load [inherent]; and
a power converter unit [10 fig. 1] including a processor [40 fig. 1; col. 4 lines 54-61],
wherein the processor dynamically optimizes the power converter to maximize the efficiency of
the transfer of energy form the power source to the load [col. 1 lines 29-38; col. 2 lines 53-55;
col. 3 lines 3-6; fig. 5].
8. As per claim 2, Jacobs discloses the power converter unit is a two phase DC/DC hard
switch converter [fig. 1; col. 1 lines 9-10].
9. As per claim 4, Jacobs discloses the power converter unit includes at least one module
[FET Q1, SR1, SR2 fig. 1].
10. As per claim 5, Jacobs discloses the processor includes a software-based [inherent as
show in col. 1 lines 35-38] program that monitor, calculates, and compares varying dynamic
parameters that affects the efficiency of the power converter supplying energy to the load [col. 2
line 61 to col. 4 line 6].
11. As per claim 7, Jacobs discloses the processor calculates efficiency by receiving the
average input and output voltage from input and output voltage sensors and average input and
output current from input current sensors to calculates input and output power, respectively [col.
1 lines 39-43].

12. As per claim 11, Jacobs discloses the processor monitors average output currents of the modules and continuously adjusts duty cycle of the system until the average output currents are the same to provide maximum efficiency [col. 5 lines 11-24; col. 8 lines 28-48].

13. As per claim 12, Jacobs discloses a method comprising the steps of:
dynamically optimizing a power converter unit [col. 3 lines 3-6] including a processor [col. 4 lines 57-61]; and
maximizing efficiency of a power converter supplying energy to a load [col. 2 lines 45-50; claim 1, 2, 3; fig. 5].

14. As per claim 13, see claim 5.

15. As per claim 15, see claim 7.

16. As per claim 19, see claim 11.

17. Claims 1-3, 5-7, 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Jacobs et al. U.S. Patent No. 6,396,725.

18. As per claim 1, Jacobs et al. disclose a device [100 fig. 1], comprising:
a power source [110 fig. 1] and a load [190 fig. 1]; and
a power converter unit [120 fig. 1] including a processor [140 fig. 1, col. 5 lines 46-47],
wherein the processor dynamically optimizes the power converter to maximize the efficiency of the transfer of energy from the power source to the load [col. 7 lines 1-11].

19. As per claim 2, Jacobs et al. disclose the power converter unit is a two phase DC/DC hard switch converter [inherent from col. 2 lines 38-52].

20. As per claim 3, Jacobs et al. disclose the hard-switch converter is selected from the group consisting of buck converters, boost converter, buck-boost converter, fly-back converters, forward converters, and push-pull converters, half bridge converters, full bridge converter [col. 5 line 42].

21. As per claim 5, Jacobs et al. disclose the processor includes a software-based [inherent as show in col. 4 lines 56-61] program that monitor, calculates, and compares varying dynamic parameters that affects the efficiency of the power converter supplying energy to the load. [col. 4 lines 62-64].

22. As per claim 6, Jacobs et al. disclose a lookup table stored internal or external to microprocessor, wherein the lookup table includes preprogrammed or dynamically created information based upon the monitored parameters [col. 4 lines 56-61].

23. As per claim 7, Jacobs et al. disclose the processor calculates efficiency by receiving the average input and output voltage from input and output voltage sensors and average input and output current from input current sensors to calculates input and output power, respectively [col. 7 lines 42-56].

24. As per claim 12, Jacobs et al. disclose a method comprising the steps of:
dynamically optimizing a power converter unit [col. 9 lines 26-37] including a processor [140 fig. 1]; and
maximizing efficiency of a power converter supplying energy to a load [col. 9 lines 38-65].
25. As per claim 13, see claim 5.
26. As per claim 14, see claim 6.
27. As per claim 15, see claim 7.

Claim Rejections - 35 USC § 103

28. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

29. Claims 9 and 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. as applied to claim 1, 5, 7 or 12 above, and further in view of Telefus et al. U.S. Patent No. 6,304,473 ("Telefus").
30. As per claim 9, 17, Jacobs do not explicitly teach the processor adjusts frequency of device to provide maximum efficiency. Telefus teaches another self-compensating switching power converter. Specifically, Telefus teaches the processor [pulse optimizer, col. 4 line 60]

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adjusts frequency of device to provide maximum efficiency [col. 4 lines 30-38; from col. 4 line 52 to col. 5 line 11].

At the time of the invention was made it would have been obvious to one of ordinary skill in the art to have modified to system of Jacobs et al. with the adjustment of frequency of Telefus to optimize the performance of the power converter [col. 3 lines 11-14].

31. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. as applied to claim 1, 5, 7 or 12 above, and further in view of Wilcox et al. Patent No. 5,481,178.

32. As per claim 8, Jacobs et al. do not teach the processor monitors and the compares output power in view of an operating system power level to determine the number of modules to be activated to provide maximum efficiency. Wilcox et al. teach another method relates to the maintaining high efficiency over broad current ranges in a push-pull power converter. Specifically, Wilcox et al. teach the processor [control circuit 35 fig. 1, 70 fig. 2] monitors and the compares output power in view of an operating system power level to determine the number of modules to be activated to provide maximum efficiency [col. 4 lines 19-30; col. 5 lines 52-58; col. 7 lines 7-37].

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the system of Jacobs et al. with the determining the number of modules to be activated of Wilcox et al. in order to increase the efficiency of the overall circuit [col. 2 lines 41-43].

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33. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al. as applied to claim 1, 5, 7 or 12 above, and further in view of Nebrigic et al. US 20030179550.

34. As per claim 10, Jacobs et al. do not teach the processor monitors temperature of each module and continuously adjust duty cycle until the monitored temperatures are the same to provide maximum efficiency. Nebrigic et al. teach another power converter. Specifically Nebrigic et al. teaches the processor [not show] monitors temperature of each module and continuously adjust duty cycle until the monitored temperatures are the same to provide maximum efficiency [paragraph 0039].

At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified the system of Jacobs et al. with the continuously adjust duty cycle until the monitored temperatures are the same of Nebrigic et al. in order to increase the power efficiency of the circuit.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent T. Tran whose telephone number is (571) 272-7210. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas c. Lee can be reached on (571) 272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vincent Tran

A handwritten signature in black ink, consisting of a stylized, overlapping loop followed by a horizontal line extending to the right.